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Attorney Docket No. RCA89038

REMARKS

The original filing of the present application included Claims 1-9. No additions of claims have been made in the prosecution of the present application. Claims 1-7 are currently pending in the present application. Claims 8 and 9 have been cancelled by a previous amendment.

Rejection of Claims 1-7 under 35 U.S.C. § 112, first paragraph

Claims 1-7 are rejected as containing subject matter not described in the specification. In response to this rejection applicant respectfully submits that all limitations in claims 1-7 as amended are clearly shown in Figure 3 and discussed in the specification. A marked up copy of Figure 3 identifying each claim element is attached to this response.

Regarding the limitation of the plurality of groups of semiconductor switches separated into groups of switches. First and second groups of switches are circled and identified in the attached Figure 3. The groups of switches are separated into subgroups of switches, the Examiner's attention is directed to subgroup (1) and subgroup (2) labeled in the attached Figure 3. As can also be seen from Figure 3, a first local data bus, i.e. brightness information carrying conductors DB(1)-DB(4), are connected to a first group of switches. The first group of switches is separated into a plurality of subgroups, each subgroup being connected to a respective conductor of the control bus DW(1)-DW(24). Each switch in a first subgroup of switches is connected to both a respective conductor of the first local data bus, i.e. brightness information carrying conductors DB(1)-DB(4) and via a common terminal to a respective conductor DWC(24) to a respective conductor of the control bus. Each switch in a second subgroup of switches is connected to both a respective conductor of the first local data bus, i.e. brightness information carrying conductors DB(1)-DB(4) and via a common terminal to a respective conductor DW(1) of the control bus. As can also be clearly seen from Figure 3, a second local data bus, i.e. brightness information carrying conductors DB(5)-DB(8), are connected to a second group of switches. The second

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group of switches is separated into a plurality of subgroups, each subgroup being connected to a respective conductor DW(1)-DW(24) of the control bus. Such is clearly shown in Figure 3. As Figure 3 illustrates all matter within the amended claims and is part of the original disclosure it is respectfully submitted that support exists for the subject matter claimed in the amended claims.

In view of the above remarks, it is respectfully submitted that as Figure 3 is part of the original disclosure and thus support exists within the originally filed application for the amended claims. It is thus further respectfully submitted that this rejection is satisfied and should be withdrawn.

Rejection of Claims 1-6 under 35 U.S.C. § 112, second paragraph

Claims 1-6 are rejected under 35 USC 112, second paragraph as being indefinite. Claim 1 has been formally amended in accordance with the comments of the Examiner to clarify the conductors of the control bus from the conductors of the plurality of local buses. It is respectfully submitted that the amendments to claim 1 are for purposes of clarification only and raise no new issues. In view of the amendments to claim 1, it is respectfully submitted that this rejection is satisfied and should be withdrawn.

Rejection of Claims 1-6 under 35 U.S.C. § 102(b)

Claims 1-6 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Shinya, U.S. Patent No. 5,170,158.

The present claimed invention is an arrangement for transferring pixel information with respect to pixels arranged in columns and rows of an array of a display device. The arrangement includes a plurality of semiconductor switches, each having a first terminal, a second terminal and a third terminal. The plurality of semiconductor switches are separated into groups of semiconductor switches and the groups of semiconductor switches are separated into subgroups of semiconductor switches. A

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control bus has a plurality of conductors. Each conductor is coupled to the first terminal of each of the plurality of semiconductor switches in a respective subgroup for communicating corresponding signals. A plurality of local buses that are separated from one another are provided for communicating corresponding signals. Each of the plurality of local buses is associated with a respective group of semiconductor switches and have a plurality of conductors. Each of the plurality of conductors have a first bus section extending in a manner to cross the plurality of conductors of the control bus once and a second bus section connected to an end of the first bus section. The second bus section is coupled in a local, clustering bus arrangement to the second terminal of a respective semiconductor switch within each subgroup of the respective group of semiconductor switches. The associated switches have the third terminals thereof coupled to the consecutively disposed column conductors of the array of the display device.

The configuration of the buses in the present claimed invention inherently decreases the number of times the local buses cross over the control bus. The disadvantages associated with crossing of the control bus are described with reference to Figure 2 of the inventive disclosure, specifically on page 6 lines 10-14, addressing the fact that

"the number of capacitive crossovers increases geometrically with the number of data-word conductors $DW(i)$ according to the equation: number of crossovers = number of brightness information carrying conductors $DB(j) \times 1/2 \times (\text{number of data-word conductors } DW(i))$."

The present claimed invention reduces the number of times conductors $DWC(i)$ cross the bus of conductors $DW(i)$ in order to reduce dynamic power dissipation and improve yield by coupling the plurality of local buses to the second terminal of the plurality of switches in a clustering bus arrangement. The inventive application discusses its achievement of the stated objective with reference to Figure 3 stating on page 6, lines 17-29, summarizing on lines 24-29:

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"In this example, the number of crossovers of brightness information carrying conductors DB (j)-to-data-word conductors DW (i) have been reduced by a factor of about 4:1. This, advantageously, reduces dynamic power dissipation, improves yield and reduces the crosstalk among the brightness information carrying-conductors."

On page 7, lines 18-20, the interconnections of the prior art diagram shown in Figure 2 and the inventive diagram on Figure 3 are compared as 28,800 crossovers are present in the prior art and only 7,450 total crossovers are present in the present claimed invention.

Furthermore, the claimed plurality of local buses which are separated from one another in the local clustering bus arrangement reduces the capacitance formed between the local buses. As is claimed in claim 1 and can be seen in Figure 3, each local bus is associated with a respective group of switches whereby a given one of said plurality of local buses having a first bus section coupled to said second terminal of respective ones of said plurality of semiconductor switches.

Shinya discloses a display device having a driver circuit for driving data lines in a matrix display panel according to input digital signals. The driver circuit includes a number of digital-to-analog (D/A) converters, which number is less than the number of pixels contained in one horizontal scanning line. The D/A converters are repeatedly used to sequentially convert portions of the input digital image signal corresponding to one horizontal scanning line. The analog signals obtained by each D/A conversion are retained by a sample-and-hold circuit. When storage for one horizontal scanning line is completed, the signals are simultaneously delivered to the data lines.

Shinya neither discloses nor suggests "a plurality of semiconductor switches... being separated into groups of semiconductor switches and said groups of semiconductor switches being separated into subgroups of semiconductor switches" wherein "each conductor of said control bus being associated with a respective subgroup of switches within each group of switches and coupled to said first terminal of

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each switch within each respective subgroup of semiconductor switches" as in the present claimed invention.

Shinya discloses a plurality of switches. However, even if the switches are considered separated into groups and subgroups and that each of the plurality of local buses have a plurality of conductors as claimed by the Examiner, Shinya neither discloses nor suggests that "each of said plurality of conductors of said plurality of local buses having a first bus section extending in a manner to cross said plurality of conductors of said control bus once and a second bus section connected to an end of said first bus section and coupled in a local, clustering bus arrangement to the second terminal of a respective semiconductor switch within each subgroup of the respective group of semiconductor switches" as in the present claimed invention. As each subgroup as set forth by the Examiner includes only a single switch, and each switch includes only three terminals, it is impossible for each of the plurality of conductors of each local bus (5 in each local bus as claimed by the Examiner) to be connected to the second terminal of a respective semiconductor switch within each subgroup as in the present claimed invention. In order for such to occur, each subgroup would have to include at least one switch for each conductor, i.e. five (5) switches in each subgroup. Thus, Shinya as interpreted by the Examiner does not and cannot provide for "each of said plurality of conductors of said plurality of local buses ... coupled in a local, clustering bus arrangement to the second terminal of a respective semiconductor switch within each subgroup of the respective group of semiconductor switches" as in the present claimed invention.

The separation of the switches into groups and subgroups within each group and "a plurality of conductors of said plurality of local buses having a first bus section extending in a manner to cross said plurality of conductors of said control bus once and a second bus section connected to an end of said first bus section and coupled in a local, clustering bus arrangement" which allows the present claimed invention to accomplish the objective of minimizing capacitive shorting failures, cross talk among the brightness information carrying conductors and dynamic power dissipation. Such is not accomplished by the device of Shinya. Shinya, as illustrated in Figure 2 connects a

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DAC 15 to a number of sample and hold circuits. Each DAC 15 inputs a digital image signal corresponding to a set of twenty pixels into one sample and hold circuit 16, placing a digital image signal corresponding to a next set of twenty pixels into another sample and hold circuit 16. In Shinya, each local bus crosses the control bus once and then crosses four (4) of the individual conductors of the control bus twenty (20) more times and the fifth (1) conductor another time. Thus, as is shown and described in the figures of Shinya, the control lines cross each conductor numerous times. As discussed above, this configuration is contrary to the purpose of the present claimed invention. Thus, a capacitive coupling is incurred in the design of Shinya at each cross over as discussed in the present specification with respect to the prior art Figure 2. In the present claimed invention a plurality of local buses, each local bus including a plurality of conductors, are separated from one another and have a plurality of conductors coupled in a local, clustering bus arrangement. This configuration minimizes the number of crossovers in order to reduce dynamic power dissipation, improve yield and reduce crosstalk among the brightness information carrying-conductors. Shinya is concerned with reducing the number of DAC's and thereby reducing the size of the display device as opposed to the present claimed invention which is concerned with improving the yield and reducing crosstalk among the conductors.

Accordingly, in view of the above remarks, it is respectfully submitted that the present claimed invention is not anticipated by Shinya and that the rejection of Claim 1, under 35 U.S.C. § 102(b) is satisfied. Additionally, because Claims 2-6 depend from the independent Claim 1, dependent claims 2-6 also satisfy this rejection for the same reason as Claim 1. In view of the above remarks it is respectfully submitted this rejection of claims 1-6 be withdrawn.

Rejection of Claim 7 under 35 U.S.C. § 102(b)

Claims 7 stands rejected under 35 U.S.C. §102(b) as being anticipated by Inoue et al., U.S. Patent No. 5,113,181.

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The present invention as claimed in claim 7 recites a signal demultiplexer for a display panel. The signal demultiplexer includes a plurality of switch groups. Each switch group includes a plurality of subgroups. Each subgroup has ordinally numbered switches 1 thru n arranged sequentially. Each switch has respective input, output and control terminals with the control terminals of all switches in each subgroup being connected to a common control terminal, and having respective output terminals coupled to successive data lines on the display panel. A plurality of groups of data buses are each associated with a respective switch group. The groups of data buses have ordinally numbered conductors 1 thru n. The ordinally numbered conductors of respective groups of data buses are coupled to input terminals of a corresponding. A control bus includes a plurality of conductors and is arranged to cross the plurality of groups of data buses. Connections are provided between ones of the plurality of conductors of said control bus and a common control terminal of a respective subgroup within each of said plurality of switch groups.

Inoue et al. describes a display apparatus comprising a plurality of pixels arranged in pluralities of rows and columns. This apparatus includes an N X M active matrix liquid crystal display unit having N X M pixels, each pixel being provided with a switching element. Image signal lines supply latched image signals to the switching elements and switching lines switch the switching elements. The image signal lines are divided into n blocks each having m lines which are commonly connected to one signal line through a corresponding switching element. The n lines are selectively supplied an image signal through the switching element by the image signal line, the image signal being stored in a capacitor.

Inoue et al. neither disclose nor suggest "a plurality of switch groups, each switch group including a plurality of subgroups, each subgroup having ordinally numbered switches 1 thru n arranged sequentially, and each switch having respective input, output and control terminals with the control terminals of all switches in each subgroup being connected to a common control terminal" as in the present claimed invention. Inoue et al. includes a plurality of switch groups. However, the switches within each group are not divided into subgroups with the control terminal of each switch within a subgroup

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connected to a common control terminal" as in the present claimed invention. In Inoue et al., the control terminal of each switch within a group are connected to a common control terminal. Thus, unlike the present claimed invention, Inoue et al. neither disclose a plurality of subgroups within each group "with the control terminal of each switch within a subgroup connected to a common control terminal."

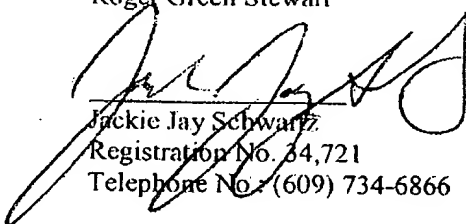
Inoue et al. also neither disclose nor suggest "a plurality of groups of data buses, each group of data buses being associated with a respective switch group and having ordinally numbered conductors 1 thru n, the ordinally numbered conductors of respective groups of data buses being coupled to input terminals of a corresponding ordinally numbered switch of each subgroup within the respective switch" as in the present claimed invention. Inoue et al. disclose a plurality of signal lines, each signal line being coupled to an input terminal of one switch in each switch group.

Accordingly, it is respectfully submitted that the present invention as claimed in Claim 7 is not anticipated by Inoue et al. It is thus further respectfully submitted that this rejection under 35 U.S.C. § 102(b) is satisfied and should be withdrawn.

In view of all of the foregoing, it is submitted that the amended application is now in condition for allowance, and such action is respectfully requested.

No additional fee is believed due with this amendment. However, if an additional fee is due, please charge the additional fee to Deposit Account 07-0832.

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